

APPENDIX 2-D

**DETAILED DESCRIPTION OF THE
HIGHWAY-ONLY SYSTEM IMPROVEMENTS**

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Highway-Only Improvement Options

The Modal Alternative highway-only option is designed to address the forecasted total intercity travel demand of 68 million annual passengers, and translates into additional lanes on the No-Build highway facility segments for the year 2020. The improvement options represent extensive expansion of the existing intercity highway facilities. Table 2-D-1 and Figure 2-D-1 illustrate the highway widening required under the highway only modal option.

Table 2-D-1
Highway Capacity Improvement Options—Year 2020
(2020 Intercity Travel Demand with Highway Expansion only)

Highway Corridor	Segment (From-To)	Number of Additional Lanes* (Total—Both Directions)
Bay Area to Merced		
US-101	San Francisco to San Francisco Airport (SFO)	2
US-101	SFO to Redwood City	2
US-101	Redwood City to I-880	2
I-880	US-101 to San Jose	2
US-101	San Jose to Gilroy	2
US-101	Gilroy to SR-152	2
SR-152	US-101 to I-5	2
SR-152	I-5 to SR-99	2
I-80	San Francisco to I-880	2
I-80	I-880 to I-5 (Sacramento)	2
I-880	I-80 to I-238	2
I-580	I-880 to I-5 (via I-238)	2
I-880	I-238 to Fremont/Newark	2
I-880	Fremont/Newark to US-101	2
Sacramento to Bakersfield		
I-5	I-80 to Stockton	2
I-5	Stockton to I-580/SR-120	2
I-5	I-580/SR-120 to SR-152	4
I-5	SR-152 to SR-99	4
SR-99	I-5 to SR-58	2
SR-99	Sacramento to SR-120	2
SR-99	SR-120 to Modesto	2

Highway Corridor	Segment (From-To)	Number of Additional Lanes* (Total—Both Directions)
SR-99	Modesto to Merced	2
SR-99	Merced to SR-152	2
SR-99	SR-152 to Fresno	2
SR-99	Fresno to Tulare/Visalia	2
SR-99	Tulare/Visalia to SR-58	2
Bakersfield to Los Angeles		
I-5	SR-99 to SR-14	4
I-5	SR-14 to I-405	6
I-5	I-405 to Burbank	6
I-5	Burbank to LA Union Station	6
SR-58/SR-14	SR-99 to Palmdale	0
SR-14	Palmdale to I-5	2
Los Angeles–Orange County–San Diego		
I-5	Los Angeles Union Station to I-10	4
I-5	I-10 to Norwalk	2
I-5	Norwalk to Anaheim	2
I-5	Anaheim to Irvine	2
I-5	Irvine to I-405	2
I-5	I-405 to SR-78	2
I-5	SR-78 to University Town Center	2
I-5	University Town Center to San Diego Airport	2
I-8	SR-163 to I-5	2
Notes: US-101 = U.S. Highway 101 SR = State Route I-5 = Interstate 5 * Represents the number of through lanes, in addition to the total number of lanes in the no-project highway network that approximate an equivalent level of capacity to serve the representative demand.		

Several assumptions are made in the table regarding the highway facilities that would serve the demand in each corridor. Travel between the Central Valley and the Bay Area is assumed to occur on three main corridors: I-80—between Sacramento and Oakland/San Francisco, I-580 between the northern Central Valley and the East Bay, and SR-152 between the middle portions of the Central Valley and Gilroy. The trips are assigned to these corridors based on the proportion of demand forecast between these regions and the relative travel times involved. For instance, the entire forecast travel demand between Sacramento and the Bay Area is assumed to follow the I-80 corridor. In contrast, the forecast travel demand between southern California and the Bay Area is proportioned between the SR-152 and I-580 corridors based on current travel patterns.

In the Central Valley the forecasted travel demand is split between I-5 and SR-99 based on the end points of the trip. Trips originating in southern California destined to the Bay Area and Sacramento are assigned to I-5, while trips either originating or destined to the main Central Valley Cities are assigned to

SR-99. A similar proportional split is used from Bakersfield to Los Angeles to assign capacity improvements to the I-5 (Grapevine) or SR-58/14 routes through the Antelope Valley. Intercity travel to and from cities along the coastal corridor between the Bay Area and Los Angeles was not included in the travel demand forecasts prepared for the proposed high-speed train system as it is currently proposed; therefore, trips were not assigned to this corridor. While the coastal corridor (US-101) does represent a potential travel path for intercity trips between northern and southern California, no trips were assigned to the coastal corridor (US-101) due to the circuitous nature of the route and the significantly higher travel times compared to the routes through the Central Valley.

Between Los Angeles and San Diego the travel demand is based on existing travel patterns. Trips that do not start or stop in areas along the inland corridor (I-15/I-215) are assigned to the more direct I-5 route. For simplicity, north-south oriented capacity is entirely assigned to the I-5 and I-15 facilities with the recognition that other parallel facilities exist for portions of these routes such as I-110, I-405, SR-73, I-805, and SR-163. These routes will be considered when postulating hypothetical improvements for the final Modal Alternative.

Assessment of Highway-Only Improvement Option Feasibility and Practicality

Highway facilities have practical limitations both physically and operationally. For the purposes of defining hypothetical improvements in this alternative, it is assumed that the practical operational limit of an expanded or new highway/freeway facility is twelve total traffic lanes. Because of the relatively high average vehicle occupancy rate associated with the representative intercity demand (2.4 passengers per vehicle) it is further assumed that new highway lanes could be designated (by the appropriate authorities) as either a general purpose (mixed flow traffic) or restricted use (i.e., high-occupancy vehicle or toll) "intercity highway facility". These intercity highway facilities will be designed and constructed to operate as either a mixed flow or restricted use lane depending on the local travel conditions of that specific facility. For instance, outside of the heavily congested urban areas (which is the majority of the study area) where congestion is less severe, there is no significant advantage in terms of travel speed or journey time with a dedicated high-occupancy vehicle (HOV) lane. However, in congested urban areas dedicated HOV lanes would be advantageous to minimize use of the additional facilities by single occupancy local traffic. It is also important to note that general purpose lanes would not be restrictive to single occupancy intercity trips and they would provide more flexibility and require less width as compared to HOV or toll lanes.

Overall, the highway-only improvement options represent a total of 3,300 lane-miles of new highway construction. In the central portion of the study area including the Tehachapi Mountain crossing, as many as 6 additional highway lanes would be necessary to serve the forecasted demand. This level of infrastructure improvement (expanding I-5 and SR-14/SR-58) would be difficult, because of the terrain and right of way constraints. In addition, significantly increasing the highway capacity through the central portions of the study area does not significantly effect the travel times for longer distance trips (i.e., Los Angeles to San Francisco). Trip distance would still be a determining factor in the modal choice between air travel and auto and it is unlikely that the majority of the longer distance trips would travel by auto. Feasibility concerns are also raised by the significant capacity improvements identified for the heavily congested urban areas of the study area. Existing and planned highway facilities in these urban areas have used all available rights of way. The feasibility of adding significant capacity to the existing facilities or creating new corridors in these areas is improbable.

Other concerns also exist regarding the viability of new capacity improvements to facilities in the heavily congested urban areas. In many cases the existing urban freeways are so congested that any additional capacity would simply be utilized to meet forecast urban/commute traffic demand. Adding lanes of capacity to these facilities may have no more effect than to lessen the existing peak congestion period or allow current demand to utilize the facility during these peak usage periods leaving no measurable increase in capacity to serve the intercity demand that is hypothetically proposed in this alternative. It is

the intent of this modal alternative to define improvement options based purely on serving the forecast intercity travel demand and not to explicitly account for the effects of latent demand and peak period congestion. Instead, these issues will be accounted for in the comparison of system alternatives according to the objectives set forth in the purpose and need (safety, travel time, reliability).

Figure 2-D-1
Highway Capacity Improvement Options—Year 2020
(2020 Intercity Travel Demand with Highway Expansion only)

